Section-A

Multiple Choice Questions (MCQ's)

Q.1 Selec tthe correct answer for each form the given options:

(i) Solution set of $\sqrt{y-2} = -4$ is ________.
(a) 18 (b) ±4 (c) { } (d) None of these

(ii) $(\text{Sin}\,45^\circ)^2 + (\cos...)^2 = 1$
(a) 90° (b) 60° (c) 45° (d) 30°

(iii) In 12, 13, 4, 4, 5, 7, 9 the mode is :
(a) 3 (b) 5.5 (c) 4 (d) 9

(iv) $\frac{\log_5 3}{\log_5 2} =$ ________
(a) $\log_5 2$ (b) $\log_5 3$ (c) $\log_3 2$ (d) $\log_2 3$

(v) $\begin{bmatrix} 4 & 0 \\ 0 & 4 \end{bmatrix}$ is a ________ matrix:
(a) Rectangular (b) unit (c) Scalar (d) diagonal

(vi) The characteristic of log 5.723 is :
(a) 1 (b) -1 (c) 0 (d) 2

(vii) A circle passes through all the vertices of a triangle is called:
(a) Segment of circle (b) Circum circle of triangle
(c) Inscribed circle of triangle (d) Escribed circle of triangle

(viii) Cartesian product of sets A and B is written as.
(a) A.B (b) A x B (c) $A\Delta B$ (d) $B \times A$

(ix) {2, 4, 6...............} is the set of:
(a) Prime number (b) Odd number (c) Even number (d) Whole number

(x) The polynomial expression $x^2 + 7x + 3$ w.r.t the terms is called;
(a) Binomial (b) Trinomial (c) Monomial (d) None of these

(xi) If $\log_{10} 1000 = y$ then y = ________
(a) 2 (b) 3 (c) 10 (d) 5

(xii) The value of Sin 45° = ________
(a) 2 (b) $\frac{1}{2}$ (c) -2 (d) $\frac{1}{\sqrt{2}}$

(xiii) $(a+b)^2 - (.....) = 4ab$
(a) a - b (b) a + b (c) $(a - b)^2$ (d) $(a + b)^2$

(xiv) In scientific notation 0.000537 is written as;
(a) 0.573×10^{-4} (b) 5.73×10^{-4} (c) 57.3×10^{-5}
(d) 0.0573×10^{-2}

(xv) $x^3 - x^2 + 2 =$ ________.
(a) $(x-1)(x^2+2x+2)$ (b) $(x+1)(x^2-2x-2)$
(c) $(x+1)(x^2+2x-2)$ (d) $(x+1)(x^2-2x+2)$

(xvi) $\frac{a^9}{a^2} =$
(a) a^{11} (b) a^7 (c) a^{18} (d) None of these

(xvii) The H.C.F of $x^3 - 8$ and $x^4 - 16$ is ________
(a) $(x^3-8)(x^4-4)$ (b) $x^4 - 4$ (c) x - 2 (d) x + 2

(xviii) If (x- 2) (x + 3) = 0,then x =
(a) -3, -2 (b) 2, 3 (c) -3, 2 (d) 3, -2

(xix) An angle greater than 90° is called ________.
(a) Acute angle (b) Obtuse angle (c) right angle (d) None of these

(xx) The triangle having no sides congruent is called ________
(a) Isosceles triangle (b) Scalence triangle (c) Equilateral (d) Acute triangle

Section-B

Note: Solve any TEN of the following questions. Each question carries 05 marks.

Q.2 Define any TWO of the following and draw figure.
Triangle Transversal Diameter

Q.3 Prove that $\cos^2\theta - \sin^2\theta = 1 - 2\sin^2\theta$

Q.4 Find H.C.F of $x^2 + x - 2$, $x^3 + 2x^2 + x + 2$ by division method.

Q.5 If =(a , b), B = {2, 3} and C={3, 4} find the value of:
(i) $A \times (B \cup C)$ (ii) $A \times (B \cap C)$

Q.6 Fine the value of $x^2 + \frac{1}{x^2}$ when $x = 2 + \sqrt{3}$

Q.7 Describe the advantages and disadvantages of mode.

Q.8 What should be added to $x^4 + 4x^3 + 10x^2 + 14x + 7$ to make it perfect square.

Q.9 Eliminate "y" from the following equations.

$\frac{y}{b} + \frac{b}{y} = 2c$, $\frac{y^2}{b^2} + \frac{b^2}{y^2} = a^2$

Q.10 Simplify: $\frac{1}{4a^2 - b^2} - \frac{1}{2a-b} + \frac{1}{2a+b}$

Q.11 Two numbers are in the ratio of 13:11 and their difference is 12.Find the numbers.

Q.12 Construct a triangle ABC in which $m\overline{AB} = 5$cm, $m\angle B = 105^\circ$ and $m\overline{BC} = 4$cm Draw it circumscribed circle.

Q.13 Find the value of $\frac{0.87}{(28.9)(0.985)}$ with the help of logarithm.

Q.14 Factorize any TWO of the following:
(i) $x^2 + 15x - 100$ (ii) $a^4 + a^2 + 1$ (iii) $8x^3 - 27y^6$

Q.15 The sum of two algebraic expression is $4x^2 - 3x^3 + 2x^2 - a$, if one of them is $2x^4 + x^3 - x^2 + 2a$, then find the other.

Section-C

Note: Solve any THREE of the following questions.Each question carries 10 marks.

Q.16(a) Fine the L.C.M of the given polynomials by factorization
x - y , $x^2 - y^2$, $x^3 - y^3$ and $x^4 + x^2y^2 + y^4$

(b) Solve the equations: x + y = 4 , 2x - 1 = 5y

Q.17 (a) Solve the triangle ABC whe $m\angle C = 90^\circ$, $c = 10\sqrt{2}$ cm and a = 10cm.

(b) A tree of 180 dm height on one baknk of the river makes angle of 30° directly on the opposite side of the river Find the width of the river.

Q18 (a) Prove that, if two sides of a triangle are congruent th eangle opposite to them are also congruent.

(b) Draw a circle with radius 4.5cm Draw a tangent at a point M to the cirlce.

Q.19 (a) A father is twice old as his son,8 years back their ages wre in the ratio of 8:3 .Find their present ages.

(b) If $A = \begin{bmatrix} 1 & 3 \\ 2 & 4 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 5 \\ 3 & 0 \end{bmatrix}$, $C = \begin{bmatrix} 3 & 1 \\ 2 & -1 \end{bmatrix}$ then prove that A(B + C) = AB + Ac

Q.20 If U = {1,2,3..........20}, A = [1,2,4,8,10,16,20}] and B = {2, 8,8,10, 14, 18), then verify De Morgan's Laws.